

Space News Roundup

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No. 32

Old equipment gains new life in schools

By Eileen Hawley

Computer literacy may be the key to success in the next century and JSC employees have an opportunity to help their children get a head start on those vital skills through JSC's Property Disposal Program.

Over the next several months, a large quantity of 286 and 386 computers, excessed as employees receive newer, faster machines, will become available through the program.

"We want to get the word out to local schools that this program exists and that we have equipment available for their use," said Property Disposal Officer Eileen

Bellmyer. "We're hoping that our employees will pass the word along to their children's teachers."

Schools may participate in the Property Disposal Program visiting JSC's warehouses to obtain equipment designated as excess for use in the schools. The Property Disposal Program has been in place for more than one year and Bellmyer reports that a number of schools have visited JSC's warehouses to obtain excess government equipment.

"Everyone wins with this program," Bellmyer said. "Rather than having this equipment sit idle in the warehouse, it can be used as a

valuable teaching tool for students."

The disposal process is simple. Schools interested in the program should send a letter to Bellmyer at mail code JF34 designating individuals authorized to screen the warehoused material for availability and acquisition by the school. These "screeners" are given access to the property disposal warehouse to review any excess equipment currently housed there. During these visits the screeners can designate and place a hold on any piece of equipment for their school. Participants are encouraged to visit the warehouse frequently since equipment flows through the warehouse

on a daily basis and there is no way to predict what equipment will be stockpiled on any given day.

There are some limitations on the availability of equipment to the schools. Although screeners can identify and place a hold on a particular piece of equipment for donation to their school, federal regulations require that all excess government equipment must first be offered to JSC and other federal employees.

Within the first ten days of its warehousing, any equipment entering the property disposal system may be claimed for government use by JSC and other NASA center

employees. At any time during the subsequent 30 days of warehousing any federal employee may claim equipment for use in the performance of their job.

If equipment previously frozen by an authorized screener for the program is not claimed by JSC or other federal employees within the 30-day limit, the school is notified of its availability for pick-up. Equipment which has been in the warehouse for 60 days or more may be selected and removed by authorized schools on the same day. The property disposal warehouse is open from 7:30 a.m.-4 p.m. during regular work days.

Dante II gets helicopter airlift from volcano

After completing all of its scientific objectives, a stranded Dante II robot was airlifted out of the Mt. Spurr crater in Alaska on Saturday after shifting soil flipped the telerobotic explorer on its side.

Dante II is now on its way back to Carnegie Mellon University in Pittsburgh, which developed the eight-legged robot in cooperation with NASA.

While ascending on a steep cross-slope some 400 feet below the rim of the crater, the terrain under the left legs of the robot collapsed, causing the robot to slide across the slope and roll onto its left side. It appeared that the terrain, having been saturated with water from the ongoing snow melt, was not able to support the weight of the 1,700-pound robot and simply gave way as the robot walked. Neither the onboard behaviors of the robot nor the human operators were able to react fast enough to prevent the system from toppling.

"The soil collapsed and flipped it over," said Butler Hine, an Ames Research scientist.

An initial attempt to airlift the robot out of the crater failed on Aug. 9 when the line being used to hoist it broke. A Dante II team member and an experienced rock climber from Anchorage climbed into the crater of Mt. Spurr, about 90 miles west of Anchorage Saturday, placed a sling around the robot and attached it to a line hanging from a Kenai Air Alaska helicopter. The helicopter lifted it and flew it several thousand feet to a runway on the side of the volcano. From there, it was ferried to Kenai, where the helicopter was based, and prepared for the trip home.

Before the robot lost its footing, it had spent a week walking into the crater and on the floor of the crater, gathering data on the active volcano, which erupted three times in 1992. Observations measured the chemical properties and temperature of the crater floor and provided high-resolution photographs. Scientists hope the information gleaned during Dante II's descent will provide clues as to when the volcano will erupt again.

The robot, controlled from a command center in Anchorage using satellite and Internet connections, transmitted data and pictures back from the floor of the crater as scientists tested its utility in exploring areas too hazardous for humans to visit. NASA is interested in the use of telerobotic devices for future exploration of the Moon, Mars and other planets.

The team in Anchorage relied
Please see **PROBE**, Page 4



NASA Photo

During the launch countdown dress rehearsal for STS-68, the six crew members paused in the White Room at Launch Pad 39A. From left, Pilot Terry Wilcutt, Payload Commander Tom Jones, Commander Mike Baker, and Mission Specialists Dan Bursch, Jeff Wisoff and Steve Smith. *Endeavour* was set to begin its 10-day mission Thursday morning.

SRL flight ready to observe Earth

By James Hartsfield

All preparations were smooth as *Endeavour* entered the final hours of the STS-68 launch countdown Wednesday, with the weather forecast calling for an 80 percent chance of an on-time launch at 5:54 a.m. CDT Thursday.

The remnants of tropical storm Beryl, which passed well north of Kennedy Space Center, were not expected to pose a problem with launch. As of Wednesday, the countdown had moved on schedule since beginning on Monday, although some additional work was entailed as technicians reentered *Endeavour's* engine compartment to check the torque on several bolts in the shuttle's hydraulic system.

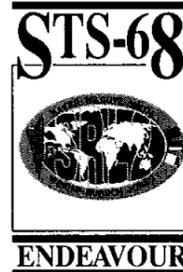
In addition, late troubleshooting was performed on the shuttle's radar altimeter, however, none of the extra work had affected the countdown. The STS-68 crew — Commander Mike Baker; Pilot Terry Wilcutt; and Mission Specialists Steve Smith, Dan Bursch, Jeff Wisoff and Tom Jones — arrived at KSC about 7:30 a.m. CDT Monday to prepare for launch. *Endeavour's* primary cargo — the Space Radar Lab — also was

in excellent shape and ready for its second trip to orbit as of late Wednesday.

During STS-68, SRL's instruments will observe most of the same areas detailed by the radar on its first flight, STS-59 in April. The second set of observations obtained on this flight will allow scientists to view the seasonal changes that have occurred in the environmental, oceanographic and atmospheric areas previously studied. The crew will be on duty around the clock, split into two 12-hour shifts on *Endeavour*.

Baker, Wilcutt and Wisoff will be on the Red Team, working a shift that will roughly coincide with daylight hours in Houston. Bursch, Jones and Smith will be on the Blue Team, working what will be a night shift in Houston terms. On the ground, the observations made by SRL will be accompanied by simultaneous teams of scientists making measurements worldwide. SRL's investigations involve more than 13 countries and 49 principal scientific investigators.

An on-time launch Thursday for *Endeavour* will lead to a landing at 10:34 a.m. CDT August 28 in Florida.



Galileo captures impact

The Galileo spacecraft is returning the first images of the impact of comet Shoemaker-Levy 9 on Jupiter in July.

The images were taken using the probe's solid-state imaging system. The partial image of the comet fragment K impact represents the return of image search "jailbars" — groups of 2 lines every 80 lines. The wide gaps will be filled in at a later time tentatively scheduled for mid-October.

The data, obtained on July 19, shows the entry of fragment K, which looks like a bright flare on the dark side of Jupiter—directly visible from Galileo's perspective — between the terminator and the dark limb of the planet lasting approximately 35 seconds. The flare at its brightest is about 10 percent the total brightness of Jupiter.

The data are not a series of snapshots of Jupiter. Rather, for purposes of increasing sensitivity and time-sampling, Jupiter was

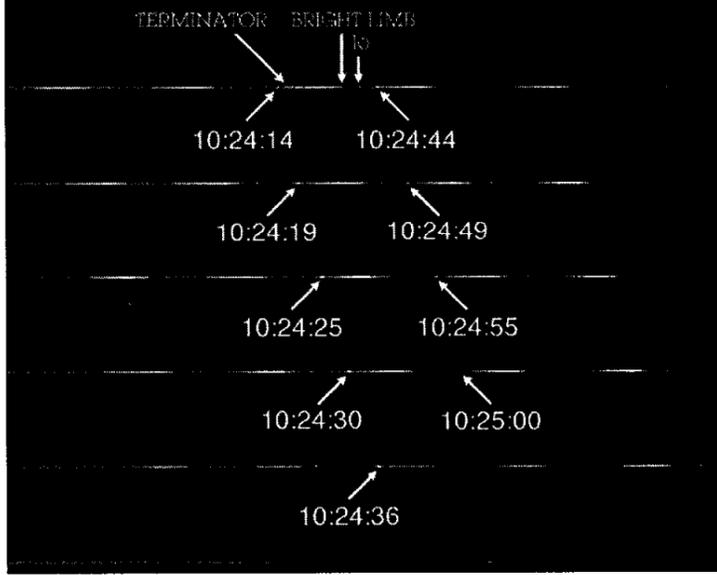
trailed in a direction roughly perpendicular to the line connecting the center of Jupiter with the impact site. The result is that Jupiter appears as a smeared diagonal bar, with the limb to the right and the terminator to the left. This process was reset and repeated five times in each image frame.

Approximately 5.4 seconds separate the jailbar samples and 30 seconds separates each diagonal scan. The entire frame covers about 2.5 minutes of the K impact.

The Galileo imaging system took data on six of the impact events: fragments D, E, K, N, V and W. No useful data was obtained on impacts D and E due to a problem with ground design software which resulted in Jupiter being out of the camera field of view for most of the observation. Data on fragments N, V and W, as well as K, should have been recorded since different imaging modes were used in these cases.

GALILEO: K EVENT

DIAGONAL DRIFT SCAN (sample every 80 lines)
SSI: 8890Å FILTER, 67 ms/line exposure



JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

EAA luau: 7:30-midnight Aug. 27, Gilruth Center, includes social period, baked ham dinner, entertainment dancing. Cost is \$17.50 per person. Tickets are on sale through Aug. 24.

Riverboat bus: Bus trip to Players Riverboat Casino from 8:15 a.m.-8:30 p.m. Sept. 10. Cost is \$22 per person. Tickets are on sale through Aug. 25.

Seaworld of Texas: Discount tickets: adult \$20.95; child (3-11), \$14.25.

Fiesta Texas: Discount tickets: adult \$18.95; child (4-11) and seniors (55+), \$14.25.

Splash Town: Discount tickets, \$11.05.

Waterworld: Discount tickets, \$10.50.

Astroworld: Discount tickets: adult \$13.75.

Moody Gardens: Discount tickets for two of three different attractions: \$9.50

Space Center Houston: Discount tickets: adult, \$8.75; child (3-11), \$7.10; commemorative, \$9.55.

Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Loew's Theater, \$4.75.

Stamps: Book of 20, \$5.80

Upcoming events: Texas Renaissance Festival, Oct. 15 & Oct. 29; Halloween Dance & Children's Halloween Party, Oct. 29; and Travel Fair, Nov. 1.

JSC history: Suddenly, *Tomorrow Came: A History of the Johnson Space Center*, \$11.

Apollo anniversary: Apollo 11 anniversary souvenirs are being restocked in the Bldg. 11 Exchange Store.

JSC

Gilruth Center News

EAA badges: Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Aug. 25. Pre-registration is required. Cost is \$5.

Defensive driving: Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Sept. 10. Cost is \$19.

Aerobics: High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month. New classes begin the first of each month.

Country dancing: Classes meet Mondays. Beginners class meets from 7-9 p.m.; advanced class meets from 8:30-10 p.m. Partners are required. For additional information, contact the Gilruth Center at x33345.

Golf lessons: Lessons for all levels. Cost is \$90 for six weeks. For additional information, contact x33345.

Volleyball registration: Registration for Mixed "C" volleyball is Aug. 16. Registration for mixed "B" women's and men volleyball is Aug. 17. For additional information, call x33345.

Basketball registration: Registration for men's basketball is Aug. 18. For additional information, call x33345.

Softball tournament: The Summer Sizzler softball tournament will be held Aug. 20 and 21. Registration is \$100. For additional information, contact x33345.

Fitness program: Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

Swap Shop

Property

Sale: Santa Fe/Alta Loma, house, 3-2, 2000 sq ft, 2.5 acre, FPL, both formal, den, pool, 409-925-1468.

Sale: Santa Fe/Alta Loma, 2.5 unimproved acres, 409-925-1468.

Sale/Lease: University Trace condo, 2-2, completely redecorated, FPL, WD, refrig, \$565/mo. 488-5092.

Sale/Lease: Webster, Sterling Knoll, 3-2.5-2, FPL, formal DR, cul-de-sac, \$850/mo. 332-6409.

Sale: Meadowbend, LC, 2 story, 3-2.5-2, 2200 sq ft, FPL, new flooring, A/C, heat, lg trees, \$85.9k. x31891.

Sale/Lease: LC, Newport, 4-2-2, \$68k or \$850/mo. 262-3130 or 332-4366.

Sale: Seabrook, 3-2 A frame, carport, spiral staircase, vinyl siding, 15x15 deck, near water, \$59.9k, 474-9569.

Sale: Egret Bay Villas, condo, 1-1, sec gate, cov parking, appl, new siding, \$38k. x31830.

Sale: University Green park, 3-2 patio home, huge deck, sprinkler sys, pool, no agents, \$125k. 488-5500.

Sale: Heritage Park, 3-2-2, clean, loan assumable, \$75.9k. Bill, 996-1067.

Lease: Baybrook condo, 1-1-1cp, upstairs, corner unit, 749 sq ft, W/D, new paintcarpet, \$435/mo + dep. FPL, x32142 or 480-9701.

Sale: LC, 3-2-2, cul-de-sac, large yard, brick, forclosure, \$58k. James, 286-1934.

Lease: Sagemont Townhouse, 2-2.5, all appl, FPL, no pets, avail Sept, \$675/mo. x30961 or 481-1239.

Sale: Pasadena, 4-2-2, both formal, 2100 sq ft, \$78.5k. Tamela, x36155 or Cindy Cole, 479-6489.

Sale/Lease: Pebblebrook condo, 1-1, W/D, FPL, \$350/mo w/in down 15 yrs, or \$395/mo. Tom, 335-1514.

Lease: CL area condo, 2-1, W/D hookup, storage area, ex cond, new carpet, no pets, \$475/mo. 486-2048.

Sale: Two four-plexes, 2 BR, 2 patios/balconies ea, FPL. Dan, Bennett, 388-1095.

Sale: '83 Redman Mobile home, 14x70, 2-2, CA/H, vinyl siding, skirting, 2 sets concrete steps, mini blinds, ex cond, to be moved. Linda, 283-0311 or 409-925-4862.

Rent: Breckenridge, CO 4-3-loft, sleeps 12, panoramic views, \$150/night in summer. 303-482-9124.

Rent: Arkansas cottage overlooking Blue Mt Lake, furn, screened porch, \$250/wkly, \$50/tyr. x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: Southern CO, 2 BR house, furn, sleeps 5, no smoking or pets, dly/wkly/mo. Bob, x30825 or 998-7372.

Lease: Galveston Seavall condo, 1-1, 24-hr security, fully furnished, 6 mo lease min, \$395/mo. 483-0737.

Sale: Rosewood Memorial Cemetery lots, \$395 ea. x40250 or 941-3262.

Cars & Trucks

'78 Chevy Blazer, 107k mi, auto, A/C, bew tires, battery, radio, shocks, ex cond, \$1,850 OBO. Ed, 481-4889.

'84 Nissan 300 ZX turbo, 2 seater, 73k mi, leather, very clean, maint records, \$4.5k. x34723 or 326-4968.

'93 Corvette Coupe, blk, 6k mi, pwr, 2 tops, garaged, very clean, maint records, \$27k. x34723 or 326-4968.

'88 Toyota 4 Runner, red, 2 dr, 4WD, auto, pwr, cass, ex cond, \$11.2k. Jeff, x38424 or 331-7166.

'83 Cadillac Coupe DeVille, loaded, leather inter, new paint, A/C compressor, \$51.8k. Barbara, x48507.

'83 Ford Ranger, work truck. x35923 or 334-7542.

'90 Ford Ranger XL, 4 cyl, 5 spd, A/C, AM/FM/cass, 62k mi, bed mat, ex cond, \$5.8k. 554-2879.

'92 S-10 PU, 4WD, 4.3 V6, Tahoe pkg, auto, red ext, dk gray int, 30k mi, ex cond, \$10.5k. x30021 or 479-7947.

'85 Mustang, auto, 289 hp, good cond, needs paint, \$5k. x30572 or 339-2501.

'85 Mustang, 6 cyl, runs good, body good, \$2.8k. Jim, x45880 or 482-1807.

'87 Mercedes 260E, cream leather, 69k mi, ex cond, records, \$14.5k. x48145 or 992-3014.

'83 Pontiac J2000, runs great, 127k mi, new clutch/brakes, dented fender, \$900. x40237 or 554-4949.

'73 Streamliner, 32', ex cond, AH, rear bath, complete kitchen, outside awning, \$6.2k. Jr. x36055 or 946-2581.

'74 Triumph Spitfire, new tires/int paint, spare eng, removable hard top, \$1,650. Craig, x36206.

'89 Mustang LX, ex cond, 60k mi, \$3.9k. Darius Davis, 996-9933.

'84 Nissan 300 ZX, ex cond, \$2.9k. x30737.

'86 Toyota PU ext cab, long bed, 5 spd, \$3.5k neg. x38753 or 334-4937.

'89 Cutlass Supreme Int'l, 2 dr, loaded, ex cond, 60k mi, \$8.5k. x40215.

'85 Nissan 300 ZX, 5 spd, T-tops, all electric, ex cond, \$4.2k. 333-6795.

'91 Honda Prelude SI, leather, blk, 5 spd, sunroof, alloys, loaded, \$13.8k. x38672 or 930-0150.

Boats & Planes

Grumman 17' alum canoe, ex cond, w/paddles and cartop carrier, \$250 OBO. Steve, x37152 or 992-7049.

Wave Runner-Wet Jet, 432 cc eng, 2-person watercraft, Sportsman galv trailer, custom cover, \$4k. Judy, x33626 or 559-2331.

'24' Sovereign, ex cond, depth sounder, sleeps 4, all safety equip, main + 2 jbs, Johnson 9.9HP O/B, recent bottom job, \$9.2k. Mike, 282-2787 or 532-1240.

'81 Catalina 25, 7.5 Evinrude, O/B, poptop, bimini, head, \$9k. 334-6615.

Windsurfers: Alpha 215RS w/7.2m & 5.5m sails, \$395; Alpha 110G w/6.3m & 4.6m sails, \$295. Stan, x34057 or 488-6822.

Boat trlr, galv, tilt, lg wheel single axle for 17-19' boat, \$400 OBO; Johnson 75 elec start w/all controls & SS prop, \$500 OBO. Bill, x48617 or 337-5018.

Baymaster 18' sailboat, 4 hp Evenrude, \$750 OBO. 482-2498.

Cycles

Men's Schwinn, 5 spd bike, steel frame, friction shift, alloy hubs, 27" steel rim, ex cond, \$85. 334-3320.

Destato, cust road racing bike frame, fork, hdst & btm bracket, super lite wt, \$250; HED solid disk wheel, \$150; set Campy wheels, \$75. George, 481-2510.

Men's Raleigh Olympian 12 spd bike, Shimano 100-series pedals, 90 psi tires, Vetta computer, \$125. Keith, 335-2514 or 332-9414.

Honda CL350, red, good cond, runs, \$350 OBO. 482-2498.

Audiovisual & Computers

Commodore 64, extra kybd & HD, modem, ed software, \$100 OBO. Sandy, x33315 or 334-7542.

Computer 486/33DX, 4MB RAM, 130MB HD, 3.5 & 5.25 FD, 2 SIP ports, 14 NI SVGA monitor, 101 kybd, DOS, Windows, 3.1, \$1k. Gunter, 488-8398.

Utah stereo spkrs, 10", 3 way, ex cond, \$50. Mark, x38013 or 992-4132.

AST 486SX/25, 5MB RAM, 170MB HD, 1.44MB FD, SVGA monitor, 101 kybd, mouse, Windows, \$795; Epson LQ1050 24 pin printer, \$80; Niscan OCR hand scan, \$80. Kelley, x36818 or 488-8194.

AT&T 6300, 640K RAM, 30MB HD, 1 FD, color monitor, modem, Epson FX-85 printer, \$150. x47389 or 946-2806.

Sony 7" reel-to-reel rcrdr, 65 tapes, \$200 OBO; Isaac Asimov, Voyage to the Outer Planets & Beyond, VHS video tape, \$20; America's Achievement in Space, 8 video set Eastman press, \$140 OBO. 488-3975.

Kenwood TS-440-S, pwr supply, Cushcraft R-5 antenna, 250Hz & 1.8kHz, narrow filters, MC-60 mike, \$1k. x35520.

Shortwave recvr, Yaesu FRG-7 tabletop, all modes, \$195. Cliff, x40230 or 543-4145.

JSC

Dates & Data

Today

Cafeteria menu — Special: tuna noodle casserole. Total Health: steamed salmon steak. Entrees: steamed salmon steak, roast beef, baked chicken, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: French cut green beans, cauliflower with cheese, green peas, black-eyed peas.

Aug. 21

Chorus auditions — The Bay Area Chorus will hold auditions for the Fall 1994 season from 3-5 p.m. Aug. 21 at Clear Lake Presbyterian Church, 1511 El Dorado Blvd. For an appointment, call 684-6030.

Monday

Cafeteria menu — Special: breaded outlet. Total Health: crispy baked chicken. Entrees: baked chicken, beef chop suey, smoked sausage and German potato salad, French dip sandwich. Soup: cream of broccoli. Vegetables: okra and tomatoes, peas, navy beans, baby carrots.

Tuesday

Cafeteria menu — Special: fried chicken. Total Health: vegetable lasagna Entrees: Salisbury steak, steamed pollock, vegetable lasagna. French dip sandwich. Soup: split pea and ham. Vegetables: mixed vegetables, French cut green beans, pinto beans, vegetable sticks.

Wednesday

Cafeteria menu — Special: stuffed bell pepper. Total Health: stuffed bell pepper with creole sauce. Entrees: fried catfish with hush puppies, stir-fry chicken and rice, wieners and beans, Reuben sandwich. Soup: seafood gumbo. Vegetables: buttered rice, Italian green beans, corn O'Brien, peas and carrots.

Thursday

Blood drive — Krug Life Sciences will host a blood drive from 8:30-11:30 a.m. in the parking lot at 1290 Hercules. For additional information, contact Beth Brumley, 212-1204.

Blood drive — Barrios Technology will host a blood drive from 12:30-3:30 p.m. at 1331 Gemini. For additional information, contact Tom Hanson, 244-7473.

Cafeteria menu — Special: barbecue smoked link. Total Health: roasted turkey breast. Entrees: turkey and dressing, beef stroganoff, chopped sirloin, French dip sandwich. Soup: tomato Florentine. Vegetables: Lima beans, buttered squash, Spanish rice, oriental vegetables.

Friday

Cafeteria menu — Special: meat sauce and spaghetti. Total Health: spaghetti noodles with turkey meat sauce. Entrees: rainbow trout, liver and onions, beef cannelloni, pork and shrimp egg roll, Reuben sandwich. Soup: seafood gumbo. Vegetables: steamed broccoli, breaded okra, cut corn, black-eyed peas.

Sept. 5

Labor Day — Most JSC offices will be closed in observance of the Labor Day Holiday.

Sept. 14

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Sept. 14 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x33077.

Oct. 10

Columbus Day — Most JSC offices will be closed in observance of the Columbus Day Holiday.

Oct. 12

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Oct. 12 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x33077.

Oct. 15

SESL reunion — The Space Environment Simulation Laboratory 30th anniversary reunion picnic will be held Oct. 15 at the Gilruth Center. The picnic is open to all present and former SESL employees and contractors. Tickets are on sale at the Bldg. 11 Exchange Store. Cost is \$10 per person. For additional information, contact Pete Gist, 474-3504 or John Ogden, 337-3494.

Nov. 9

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Nov. 9 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x33077.

Nov. 11

Veterans Day — Most JSC offices will be closed in observance of the Veterans Day Holiday.

Nov. 24

Thanksgiving Day — Most JSC offices will be closed in observance of the Thanksgiving Day Holiday.

Dec. 14

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Dec. 14 at the Holiday Inn on NASA Road 1. For additional information, contact Elaine Kemp, x30556 or Diana Peterson, x33077.

Dec. 26

Christmas Holiday — Most JSC offices will be closed in observance of the Christmas Holiday.

Miscellaneous

Pres & First Lady Executive Gold charter membership, \$500. Jim, x46238.

Man's wedding band, diamond & gold, sz 8-9, never worn, \$150 OBO. x34557 or 485-1541.

Triple action exer bike, ex cond, \$140; wnt qn sz wtrbd cov, ex cond, \$20; stuffed Koala bear dress lamp, \$5; boys clothes, 6 mos - 4T, stuffed animals, 992-1768.

Swing set delux, 4 swing types, side climbing platform, slide, new \$550 sell \$225. Steve, x36725.

Exercise bike, peddle only \$30; exercise bike, peddle & row, \$45; love seat, brn velour print, contemporary style, x40250.

Indust, multishelf dolly, 2000lb cap, was \$600, now \$175; 1/3 hp air comp, \$50 OBO; Casio graphing calculator, was \$100, now \$15. 481-2510.

Diamond wedding set, marquise shaped 0.50 carat, center stone set in 14k yellow gold w/6 marquise-shaped diamonds, 0.06 carat ea, total carat wt is 0.86. \$900. Kathleen, x36701.

14k gold herring bone necklace, 20" long, 4.6 mm width, \$105. Eric, 31917.

Jobe spectra 1200 slalom waterski w/deep skag & skag fins, extra lg bindings, men's sz 11-13, adj binding plates, Hydroglit proseries, \$125. x30021 or 479-7947.

Browning A-bolt 22 RF, w/Millett steel rings, \$350. Howard, x37346.

Bedliner for longbed Ford PU, \$75. Nelda, 333-7686 or 332-5641.

Arneson automatic pool cleaner, was \$506 now \$200. 409-765-7665.

Mower, 3.5 hp, rear discharge, \$80; drop spreader, \$15. John, x39007.

Diamond engagment ring w/5 ct marquise solitaire on wide 14k gold band, appraised \$4k sell \$1.5k neg. Michele, x37501 or 488-0140.

Monkey grass, 1 gal containers, \$2.50/ea or 5 for \$10. x30974 or 554-7083.

Motorola cellular phone, 2/batt, car charger w/mount, spare car charger, home batt charger & leather case for phone, will sell sep. Faye, 470-1455.

Scuba fins, full rubber boot, sz 6-10, never used. x40237 or 554-4949.

Gasoline weed eater, runs great, \$20. Tony, x35966.

Bookcase; trailer hitch & ball; patio table & umbrella; faucet; harlequin paperback books, Paul, x31883.

Gandy sportsman oversize 8' pool table w/all access, lights, sticks & wall racks, was \$2.5k now \$1.5k. x35560 or 996-0393.

Large cargo carrier for car or van w/gutters, \$150. Marilyn, 480-1934.

Inclined sit-up bench, \$5; spring chest exerciser, \$5; wind-up baby swing, \$10. Terry, 474-5639.



'Ecological watchdogs'

STS-68 crew eyes changes in Earth's environment

By Eileen Hawley

In a mission that enhances the knowledge gained during April's STS-59 flight, the six-member crew of *Endeavour* is keeping a watchful eye on the home planet, looking for environmental and seasonal changes over the past four months.

"The Earth is a fragile place," said Mission Specialist Steve Smith "It's a

limited size, a limited resource, we need to use it very very carefully."

STS-68 will help the inhabitants of planet Earth see "where humanity is affecting things adversely" by taking images of different environments within

scientific disciplines including ecology, hydrology, oceanography and geology.

Understanding how to use the Earth while protecting its resources is a key motivator for the STS-68 crew. Using a complement of radar equipment referred to as Sir-C/X-SAR, to penetrate clouds, vegetation, dry snow and extremely dry sand, the STS-68 mission will observe and assess large-scale environmental processes on the Earth. It also will help scientists and researchers distinguish natural processes from those induced by humans.

STS-59 provided researchers with 94 hours of radar imagery covering 44 countries and 43.75 million square miles. The imagery and data gathered during STS-68 will increase researchers' understanding of the dynamics of the planet. And while

many aspects of the missions are alike, there are many differences as well.

"We will repeat a lot of the STS-59 data takes," said Pilot Terry Wilcutt, "but we also will implement a new technique called interferometry."

A new Sir-C/X-SAR experiment, interferometry takes radar images of particular areas of the Earth's surface during repeated orbital passes.

Then, with the aid of computer processing, a topographical map of the Earth's surface, accurate to about one meter in vertical relief, is produced. Once the topography is determined, a third interferometric pass determines if any topographic change

has occurred in the time between radar passes.

For example, if an earthquake occurred between radar passes, the images could show precisely where the Earth has moved said Tom Jones, payload commander for the mission, and a member of April's SRL-1 crew.

In addition to providing information about surface movement from earthquakes, Jones said interferometry could provide valuable information on the movement of glacier packs.

"I wouldn't want to sit there with a stopwatch and have to measure glacial movement," Jones said, "but with this technology and resolution we will be able to track the movement of glaciers over the seasons."

According to Jones, the work taking place on board *Endeavour* also will help produce an "integrated

study of all the world's systems — the oceans and the atmosphere, and the surface ecology and geology of the planet." According to Jones, that integrated study has practical applications for resource management.

"We can't hope to come up with efficient and cost effective solutions to the problems we are inflicting on the world if we can't understand the scale of the manmade changes in comparison to the natural system as a whole," Jones said.

Earth is often referred to as the "blue planet", a reference to the abundance of water found in its seas and oceans. The oceans are a reservoir for heat and energy, and the air-sea interaction moves this heat and energy around the globe regulating the Earth's climate.

"Probably the biggest player in meteorology is these bodies of water," said Smith. Collecting data on surface and internal waves and how waves and ocean currents interact will help meteorologists and oceanographers better understand how the ocean affects our climate.

The Sir-C/X-SAR instruments also will study snow cover in Austria and the Mammoth Mountains in California to determine spring runoff amounts that affect water supply, ground water and reservoir replenishment rates.

In addition to monitoring physical changes on the Earth's surface, instruments on board *Endeavour* also will examine carbon monoxide concentrations in the atmosphere.

"There are so many remote regions that have great impact on the atmosphere," said Commander Mike Baker. Using the shuttle as a science platform is one way to gain insight into remote or inaccessible areas of

the Earth's surface.

The Measurement of Air Pollution from Satellites experiment gages the global distribution of carbon monoxide, an important indicator of the atmosphere's ability to cleanse itself of greenhouse gases and pollutants. MAPS results from STS-59 showed low carbon monoxide concentrations in the Southern Hemisphere with a gradual movement northward.

"The MAPS instrument found very high contents of carbon monoxide in the northern hemisphere which we believe is due to weather patterns trapping industrial carbon dioxide up in that part of the world," said Mission Specialist Jeff Wisoff.

According to Wisoff, researchers expect they might see a very different distribution during the summer months as weather patterns change.

STS-68 also will be flying during the Southern Hemisphere's dry season when the maximum amount of burning to clear agricultural fields occurs. An infrared camera attached to MAPS will take pictures of each region measured and crew members will watch for signs of industrial pollution such as smoke stacks, gas flares from oil fields, or smoke and fire visible from orbit.

"Our understanding of the world's atmospheric chemistry has been very poor," Jones said. "We've been trying to improve that with shuttle missions like ATLAS that looked at trace gases in the upper atmosphere. The flights of the MAPS sen-

sors are going to be key for understanding the true state of pollution around the world. Prior to this it's been a dark vista in terms of looking at the Earth's pollution."

Crew members agree the shuttle provides a unique platform for observing the Earth and how humankind affects the planet.

"The jump in knowledge gained from this mission will be profound," Jones said. "Long term monitoring

will be key to understanding whether or not human induced pollution into the world's atmosphere is small by comparison to natural sources, so I think this is a start of a real systematic approach to

understanding the world's dynamic system."

For the crew members, the ability to view the changes happening on the Earth has far-reaching implications.

"In the extreme case, we could literally wipe ourselves out as a species," Wilcutt said. "It's possible that we could so pollute the waters, so devastate the landscape, we could change the Earth in such a way that it becomes very inhospitable and uninhabitable." The solution, according to Wilcutt is education.

"You have to learn what you're doing to the Earth and how that affects the Earth, before you can stop."

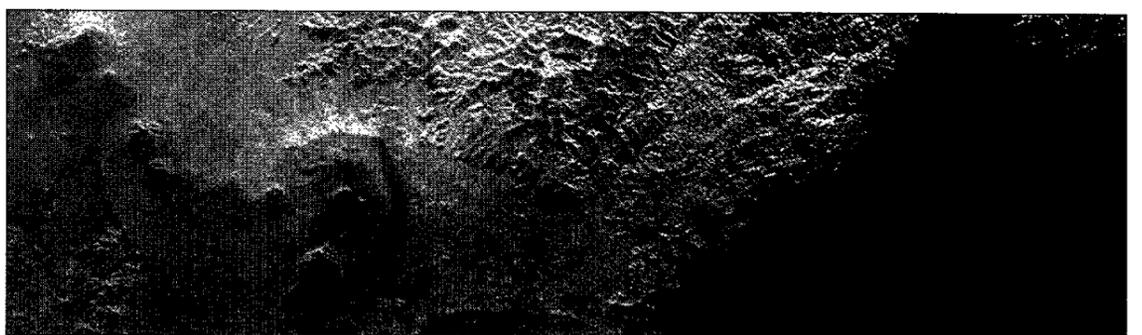
"What history is going to remember is the shift in attitude — that the people of the Earth took an interest in preserving their planet." □

'The people of Earth took an interest in preserving their planet.'

—Jeff Wisoff

'The jump in knowledge gained from this mission will be profound.'

—Tom Jones



Clockwise from top left: In this image of the Galapagos Islands taken during April's STS-59 mission, two of the six active volcanoes on the island can be seen. Rough lava flows show up as bright features, while ash deposits and smooth pahoehoe lava flows appear dark.

Variations in vegetation in the mountain highlands of Central Africa can be seen in this image of the Virunga Volcano chain along the borders of Rwanda, Zaire and Uganda. The vegetation is an important factor in the habitat of the endangered mountain gorillas.

The STS-68 crew — from left, Tom Jones, Jeff Wisoff, Mike Baker, Terry Wilcutt, Steve Smith and Dan Bursch.

Ancient drainage channels in southern Egypt near the Sudan appear in this image, which shows that in wetter times the valley would support vegetation and game animals. Today, as a result of climate change, the area is uninhabited and lacks water except for a few scattered oases.



Festival lights up evening sky with balloons

Second annual "Ballunar Liffoff '94" offers entertainment, education

Hot air balloons once again will light up the evening sky as Space Center Houston, Re/Max Realty and the Clear Lake Area Chamber of Commerce sponsor the second annual "Ballunar Liffoff" beginning Aug. 26.

Festival guests can tour a vintage World War II airplane courtesy of the Lone Star Flight Museum in Galveston, browse through arts and crafts exhibits, or munch on a variety of foods supplied by local restaurants. Entertainment will be provided by jugglers, mimes and a variety of games for all ages.

The three days of festivities begin with a KHM "Mixer" party at 5 p.m. in Rocket Park. Live music will be provided by Green

Onions until 8 p.m. At 7:30 p.m. the Re/Max Skydive Team will show off their skills to the crowd.

The evening continues with more than 50 hot air balloons from around the country participating in the "balloon glow" from 8-9 p.m. Balloon crews will fire up the propane jets inside the balloons creating a spectacular glow against the night sky.

The first balloon flight competition begins at 7 a.m. Aug. 27. Featured activities include a bean bag competition where balloon crews maneuver into position

to drop the bean bags on designated targets. Crews also will compete in a "fox and hare" race, where each crew attempts to land on a specific target before the other.

A Lifeflight helicopter from Hermann Hospital will fly into Rocket Park about 3 p.m. allowing guests an opportunity to view the life-saving aircraft up close. About 6 p.m. all 50 hot air balloons will take to the sky simultaneously, followed by another Balloon Glow beginning at 8 p.m.

On Aug. 28, more balloon flight competitions including the bean bag drop and "fox

and hare" races begin at 7 a.m. The balloon races will be followed by another demonstration of the Re/Max Invitational Skydive Texas 40-Way Jewel team jumping every two hours beginning at 9 a.m. and continuing until 5 p.m.

Gates will open to the public at 6:45 a.m. both Saturday and Sunday and there is no cost to attend the festival. Public parking is provided in the Space Center Houston Parking Lot.

For additional information on the second annual "Ballunar Liffoff", contact Space Center Houston, 244-2100 or the Clear Lake Area Chamber of Commerce, 486-7676.



Classes ease smokers' way

Banished from offices, conference rooms, and restaurants smokers find themselves confronted with a social reality of the 90's — smoking is no longer acceptable.

JSC's Employee Assistance Program has a plan to help civil service and contractor employees beat the nicotine habit and improve their health at the same time. The EAP is offering a free seven-week smoking cessation course beginning Sept. 20.

"Nicotine addiction is difficult to overcome," said program facilitator Suzanne Foster, a licensed social worker with the EAP. "We use a lot of behavioral and rational emotive techniques, but we also address the physical aspect of the problem, including nutrition and physical fitness."

The holistic approach employed in the classes addresses the "whole person" and includes the psychological and physical aspects of nicotine addiction. The classes also will address other physiological issues associated with giving up smoking including nicotine withdrawal symptoms, mood fluctuations and weight gain. Classes are free to civil service and contractor employees and their dependents since statistics show that living with a smoker can make it more difficult for someone to beat the cigarette habit.

The smoking cessation classes were offered twice last year. About 30 percent of last year's participants were still smoke free six months later, the average success rate for treatment of any kind of addiction. The typical smoker attempts to quit three times before kicking the habit for good, according to Foster.

"We consider each time a smoker makes the attempt to quit a success," Foster said. "It shows that at some level, that person is convinced they need to make that change. That's half the battle in overcoming their dependence on cigarettes."

Classes will meet from 4-5 p.m. Tuesday and Thursday nights beginning Sept. 20. Employees may register for the classes by completing forms located throughout the center or by contacting the EAP at x36130.



Photo by John McKenna

HOMEWARD BOUND: Columbia left a bright contrail in the sky over League City as it headed for a landing at Kennedy Space Center on July 23. Columbia passed over the Houston area shortly after the deorbit burn, landing in Florida at 5:38 a.m. CDT. This photograph was taken about 5:15 a.m. CDT looking north-northeast. STS-65 became the longest duration shuttle mission lasting 14 days, 17 hours, 55 minutes.

Volunteer program benefits community

By Linda Copley

JSC employees have the opportunity to give something back to the community by volunteering.

JSC's Community Affairs office maintains a list of current volunteer opportunities in both the Clear Lake area and throughout the Houston area for review by employees. The list is available in Bldg. 2, Rm. 183.

Additionally, employees interested in participating in volunteer activities on their own time can obtain a detailed description of existing needs in the local community through Kathleen Holt, Director of the Bay Area Satellite Chapter of the Volunteer Center. Holt may be reached at 333-9700.

The National Service Office was established at NASA Headquarters in 1991 to bolster the agency's commitment to community service and to support the 1990 National and Community Service Act.

That law, passed to "renew the ethic of civic responsibility" in the U.S., affirms that community service is a national priority for all Americans. The law further states that all Americans regardless of age, have a role to play in improving their communities.

Community service program offices now exist at all NASA centers to encourage employees to volunteer their personal time to fulfill community needs.

Probe retrieved from crater

(Continued from Page 1)

heavily on a laser scanner mounted atop Dante II's camera mast for three-dimensional, topographic maps to steer and align the robot.

The robot was subjected to the hazards of the environment inside the volcano crater, including bombardment by rock fall. At one point, a one-foot diameter boulder tumbled down the slope of the crater wall and hit the robot on the inner rear left leg. At the time, Dante was using the leg to provide primary support in conjunction with the other leg of the inner frame. The force of the impact

knocked the leg out of the support position and away from its foothold, but the other three legs of the inner frame had to instantly provide additional support.

Dante II evolved from the earlier Dante robot which tried over the 1992-93 New Year's holiday to descend into the live Antarctic volcano Mt. Erebus. That mission ended with the robot only 21 feet into the crater when the fiber optic cable, which was its communications lifeline, kinked and was broken due to physical and temperature stress conditions.

MCC open during flight

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-68 mission.

Based on a Thursday launch, employees will be allowed to visit the MCC from noon-2:30 p.m. and 5-7 p.m. today.

The MCC also will be open from 11:30 a.m.-2:30 p.m. and 5-7 p.m. Tuesday. Viewing hours continue from 11:30 a.m.-2:30 p.m. Aug. 25, from 11:30 a.m.-2:30 p.m. and 5-7 p.m. Aug. 26 and from 1-5 p.m. Aug. 27. There will be no scheduled view-

ing hours on Aug. 28 due to the planned landing.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Children under 5 will not be permitted. No flash photography or loud talking will be permitted at any time.

Because of the dynamic nature of shuttle missions, viewing hours may be changed or canceled without notice. For the latest schedule, call the Employee Information Service at x36765 once the mission is in progress.

Greetings from Star City

Lectures, exercise part of typical day

Editor's Note: This is the second in a series of "letters home" from Norm Thagard and Bonnie Dunbar. Thagard and Dunbar currently are enjoying some time off from their work at Star City where Thagard is training as the primary U.S. crew member for the Mir 18 mission set to launch in March, 1995. Dunbar is training as Thagard's backup for that mission and will fly as a mission specialist on STS-71, rendezvousing with Mir to retrieve the station crew in June. The two shuttle astronauts should return to JSC in October for additional training with their Russian crew mates.

Prior to going on vacation with his family, Thagard sent the following open letter to all JSC employees.

"Vacation began following classes on Aug. 5. We had two separate exams on the Soyuz television system and communications system which are relatively simple and direct. Although it was not required, I took the entire exam in Russian.

"Each exam was conducted by a board of three or four systems experts, including representatives of the "constructor" (contractor), NPO Energia. The board members were very cordial and made us feel quite at ease, a difficult task considering

we were facing an examination board that spoke no English. Test questions were determined by picking a slip of paper with the question typed on it from a stack of questions.

"We had been told it was important to answer precisely so that board members do not think your knowledge is incomplete and ask further questions beyond the typed exam questions. I must have done okay because I finished both parts of the test in under 20 minutes with no supplementary questions.

"I am finding the physical training program to be excellent. Sasha Novikov is our trainer. He is an athlete and graduate of a military sports training institute. Under his guidance, I run up to six miles at a time, lift weights, and swim — sometimes all three in the course of a two-hour physical education period.

"In general, I think Russian and American training methods are very similar. There are lectures on theory and operations followed by practical sessions in simulators. Lately, our training has focused on design and construction of the various Mir modules and the life support system on Mir. My Mir 18-specific training likely will begin following the October Soyuz launch."

NASA shares expertise in fight against disease

A unique process for growing tissue samples that could be used in AIDS research is about to be explored in depth by NASA and the National Institutes of Health.

The two agencies recently signed an agreement that will combine the unique talents and experience of both organizations by exploiting NASA's bioreactor technology to produce three-dimensional tissue cultures for laboratory research.

The goal of the agreement is to engineer a human lymph node model for AIDS research and then to extend the use of this technology to a broad spectrum of tissues available at the NIH. This collaborative effort will enable researchers to culture tissues previously deemed too complex for current technology.

Growing tissue samples under laboratory conditions, "tissue culturing", is one of the basic tools of biomedical research. Researchers create specialized environments in laboratory vessels in order to grow or "culture" tissues for further study. For example, researchers might culture cancer tumors in the laboratory so that they can study the effects of

anti-cancer drugs on the tumor.

Unfortunately, cells are highly sensitive to their growth environment and conventional tissue culturing techniques may not produce human tissue samples that closely resemble tissue structures found in the human body. As part of its ongoing program of research, NASA has developed an advanced cell culturing technology that produces improved tissue cultures that promise a superior three-dimensional structure.

"The NASA bioreactor is a very promising technology in tissue engineering," said Harry Holloway, associate administrator, Office of Life and Microgravity Sciences and Applications. "The primary thrust of this agreement will be the transfer of ground-based NASA bioreactor technology to NIH to support their cutting-edge research in complex tissue engineering."

This agreement will increase the capabilities of biomedical researchers throughout NIH by transferring NASA technology to NIH and establishing a center within the National Institute of Child Health and Human Development.

Luau banquet tickets on sale

Tickets for the Employee Activities Association's luau dinner and dance are on sale through 2 p.m. Wednesday at the Bldg. 11 Exchange Store.

The celebration takes place Aug. 27 at the Gilruth Center. The festivities begin with a social hour at 7:30 p.m. followed by a luau banquet consisting of ham, salad, and cheese-

cake starting at 8 p.m. Guests may dance to the music of "Toonz" in the ballroom and enjoy hula dancing performed by the Makana Aloha Dancers.

Dress for the event is "island casual. Cost to attend is \$17.50 per person. Tickets are non-refundable. For additional information, contact Mavis Ilkenhans, x49644.

Space News Roundup

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